



# Past Papers

# Int 1

# Chemistry

# 2014

# Marking Scheme

Grade Awarded	Mark Required		% candidates achieving grade
	(/60)	%	
A	42+	70%	44.4%
B	36+	60%	25.8%
C	30+	50%	15.3%
D	27+	45%	6.2%
No award	<27	<45%	8.4%

Section:	Multiple Choice	Extended Answer
Average Mark:	13.4	/20 26.0 /40

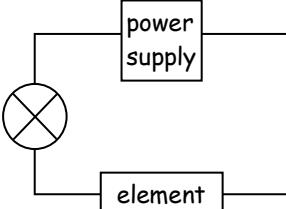
# 2014 Int 1 Chemistry Marking Scheme

## Reasoning

MC Qu	Answer	% Pupils Correct									
1	D	80	<p><input checked="" type="checkbox"/> A A gas given off does not happen in every chemical reaction</p> <p><input checked="" type="checkbox"/> B A solid being formed does not happen in every chemical reaction</p> <p><input checked="" type="checkbox"/> C A colour change does not happen in every chemical reaction</p> <p><input checked="" type="checkbox"/> D A new substance is always formed in every chemical reaction</p>								
2	A	65	<p><input checked="" type="checkbox"/> A Oxygen gas relights a glowing splint</p> <p><input checked="" type="checkbox"/> B Hydrogen gas burns with a pop</p> <p><input checked="" type="checkbox"/> C Nitrogen gas does not relight a glowing splint</p> <p><input checked="" type="checkbox"/> D Carbon dioxide gas turns lime water milky</p>								
3	D	53	<p><input checked="" type="checkbox"/> A ①+②: both particle size and temperature are changing ∴ no conclusion made</p> <p><input checked="" type="checkbox"/> B ②+③: both concentration and temperature are changing ∴ no conclusion made</p> <p><input checked="" type="checkbox"/> C ③+④: only particle size is changing ∴ conclusion on effect of particle size</p> <p><input checked="" type="checkbox"/> D ①+④: only concentration is changing ∴ conclusion on effect of concentration</p>								
4	C	29	<p><input checked="" type="checkbox"/> A Lower temperature would still give the same volume of gas (but more slowly)</p> <p><input checked="" type="checkbox"/> B More concentrated acid would give a steeper graph at the beginning</p> <p><input checked="" type="checkbox"/> C Using half a tablet gives off half the volume of gas</p> <p><input checked="" type="checkbox"/> D Crushed tablets would give a steeper graph at the beginning</p>								
5	D	87	<p><input checked="" type="checkbox"/> A Diagram shows molecule of alcohol with formula: <math>\text{CH}_4\text{O}</math></p> <p><input checked="" type="checkbox"/> B Diagram shows molecule of alcohol with formula: <math>\text{C}_2\text{H}_6</math></p> <p><input checked="" type="checkbox"/> C Diagram shows molecule of alcohol with formula: <math>\text{C}_2\text{H}_6\text{O}_2</math></p> <p><input checked="" type="checkbox"/> D Diagram shows molecule of alcohol with formula: <math>\text{C}_2\text{H}_5\text{OH}</math> (<math>\text{C}_2\text{H}_6\text{O}</math>)</p>								
6	B	83	<p><input checked="" type="checkbox"/> A Phosphorus Dichloride has a formula of <math>\text{PCl}_2</math></p> <p><input checked="" type="checkbox"/> B Phosphorus Trichloride has a formula of <math>\text{PCl}_3</math></p> <p><input checked="" type="checkbox"/> C Phosphorus Tetrachloride has a formula of <math>\text{PCl}_4</math></p> <p><input checked="" type="checkbox"/> D Phosphorus Monochloride has a formula of <math>\text{PCl}</math></p>								
7	A	91	<p>pH 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14</p> <p>Description ← Neutral → increasing acidity increasing alkalinity</p>								
8	B	43	<p><input checked="" type="checkbox"/> A Lemonade is an acid because it has carbon dioxide dissolved in it</p> <p><input checked="" type="checkbox"/> B Oven cleaner is an alkaline cleaning material</p> <p><input checked="" type="checkbox"/> C Soda water is an acid because it has carbon dioxide dissolved in it</p> <p><input checked="" type="checkbox"/> D Vinegar is a solution of an acid called ethanoic acid</p>								
9	C	82	<p><input checked="" type="checkbox"/> A nitric acid + calcium carbonate → calcium nitrate + water + carbon dioxide</p> <p><input checked="" type="checkbox"/> B hydrochloric acid + calcium carbonate → calcium chloride + water + carbon dioxide</p> <p><input checked="" type="checkbox"/> C sulphuric acid + calcium carbonate → calcium sulphate + water + carbon dioxide</p> <p><input checked="" type="checkbox"/> D phosphoric acid + calcium carbonate → calcium phosphate + water + carbon dioxide</p>								
10	D	77	<p><input checked="" type="checkbox"/> A copper and tin would produce a voltage in an electrochemical cell</p> <p><input checked="" type="checkbox"/> B iron and tin would produce a voltage in an electrochemical cell</p> <p><input checked="" type="checkbox"/> C magnesium and tin would produce a voltage in an electrochemical cell</p> <p><input checked="" type="checkbox"/> D The same metal attached in a cell does not produce a voltage in a cell</p>								
11	C	87	<table border="1"> <tr> <td>Natural Fibres</td> <td>Synthetic Fibres</td> </tr> <tr> <td>nylon</td> <td>cotton</td> </tr> <tr> <td>silk</td> <td>polyester</td> </tr> <tr> <td>wool</td> <td>terylene</td> </tr> </table>	Natural Fibres	Synthetic Fibres	nylon	cotton	silk	polyester	wool	terylene
Natural Fibres	Synthetic Fibres										
nylon	cotton										
silk	polyester										
wool	terylene										
12	D	71	<p><input checked="" type="checkbox"/> A Oil is a fossil fuel ∴ oil is a non-renewable energy source</p> <p><input checked="" type="checkbox"/> B Coal is a fossil fuel ∴ coal is a non-renewable energy source</p> <p><input checked="" type="checkbox"/> C Peat is a fossil fuel ∴ peat is a non-renewable energy source</p> <p><input checked="" type="checkbox"/> D Biogas is made from decomposing food ∴ biogas is a renewable energy source</p>								

13	A	68	<input checked="" type="checkbox"/> A $C_3H_6$ is a hydrocarbon as it is a compound containing only carbon and hydrogen <input checked="" type="checkbox"/> B $C_3H_7OH$ contains oxygen and cannot be classed as a hydrocarbon <input checked="" type="checkbox"/> C $CO_2$ contains oxygen and cannot be classed as a hydrocarbon <input checked="" type="checkbox"/> D $H_2CO_3$ contains oxygen and cannot be classed as a hydrocarbon						
14	A	30	Property	Petroleum Gas	Gasoline	Kerosene	Light gas Oil	Heavy Gas Oil	Residue
			Molecule Size	Small	↔	↔	↔	↔	Large
			Viscosity	Low	↔	↔	↔	↔	High
			Evaporation	Quickly	↔	↔	↔	↔	Slowly
			Flammability	High	↔	↔	↔	↔	Low
			Boiling Point	Low	↔	↔	↔	↔	High
15	A	62	<input checked="" type="checkbox"/> A Cracking is splitting larger hydrocarbons into smaller more useful hydrocarbons <input checked="" type="checkbox"/> B This reaction is called combustion (burning) <input checked="" type="checkbox"/> C This reaction is called combustion <input checked="" type="checkbox"/> D This reaction is called condensation polymerisation						
16	D	78	<input checked="" type="checkbox"/> A Combustion: The process of burning where the substance joins with oxygen <input checked="" type="checkbox"/> B Fermentation: glucose → ethanol (alcohol) + water <input checked="" type="checkbox"/> C Photosynthesis: carbon dioxide + water → glucose + oxygen <input checked="" type="checkbox"/> D Respiration: glucose + oxygen → carbon dioxide + water						
17	A	86	<input checked="" type="checkbox"/> A Carbon Dioxide is a cause which causes the Greenhouse Effect <input checked="" type="checkbox"/> B Sulphur dioxide causes acid rain but has not effect on the Greenhouse Effect <input checked="" type="checkbox"/> C Oxygen has not effect on the Greenhouse Effect <input checked="" type="checkbox"/> D Nitrogen has not effect on the Greenhouse Effect						
18	C	60	Leguminous plants e.g. clover, bean family and pea family have nitrifying bacteria in root nodules which convert nitrogen gas into nitrate compounds.						
19	C	38	1 pint of beer contains two units of alcohol ∴ 2 units of alcohol requires 2 hours to be broken down.						
20	C	67	<input checked="" type="checkbox"/> A carbon dioxide is used up as it is a reactant in the process of photosynthesis <input checked="" type="checkbox"/> B water is used up as it is a reactant in the process of photosynthesis <input checked="" type="checkbox"/> C chlorophyll is the catalyst which absorbs energy to catalyse photosynthesis <input checked="" type="checkbox"/> D glucose is formed as it is a product in the process of photosynthesis						

# 2014 Int 1 Chemistry Marking Scheme

Long Qu	Answer	Reasoning																																	
1a	Sb	Each element has its own symbol and atomic number. Each element symbol starts with a capital letter and if there is a second letter in the symbol then it is lower case.																																	
1b(i)	Reshapes on heating	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>thermoplastic</td> <td>Plastic which reshapes on heating</td> </tr> <tr> <td>thermosetting</td> <td>Plastic which does not reshape on heating</td> </tr> </table>		thermoplastic	Plastic which reshapes on heating	thermosetting	Plastic which does not reshape on heating																												
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1b(ii)	Fibres	Largest pie section is fibres.																																	
2a	Line graph showing:	$\frac{1}{2}$ mark Water temperature label and scale	$\frac{1}{2}$ mark $^{\circ}\text{C}$ units on x-axis	$\frac{1}{2}$ mark Points plotted correctly	$\frac{1}{2}$ mark Joining the points																														
2b	325	Answers ranging from 320 to 330 are acceptable																																	
2c	Polymers Amino acids	Proteins are <b>POLYMERS</b> and are made from <b>AMINO ACIDS</b>																																	
3a	Car engines or Thunder/lightning	Petrol engine cars have sparks from the spark plugs to ignite the petrol/air mixtures. This spark is provides the energy to join together nitrogen and oxygen. Lightning also can provide this energy.																																	
3b	sulphur dioxide or carbon dioxide	Nitrogen dioxide, sulphur dioxide and carbon dioxide all dissolve in water to form an acidic solution.																																	
3c	Any pH below 7	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td></tr> <tr><td colspan="7" style="text-align: center;">← increasing acidity</td><td style="text-align: center;">Neutral</td><td colspan="7" style="text-align: center;">→ increasing alkalinity</td></tr> </table>			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	← increasing acidity							Neutral	→ increasing alkalinity							
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← increasing acidity							Neutral	→ increasing alkalinity																											
3d	carbon dioxide	acid + metal carbonate $\longrightarrow$ salt + water + carbon dioxide																																	
4a	110	Each element has its own symbol and atomic number																																	
4b	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td></td><td style="text-align: center;">YES</td></tr> <tr><td></td><td style="text-align: center;">YES</td></tr> </table>		YES		YES	Elements in the same vertical column in the Periodic Table have similar chemical properties. The elements above Darmstadtium are all electrical conductors and conductors of heat.																													
	YES																																		
	YES																																		
4c		If the bulb lights up then the element being tested is an electrical conductor																																	
5a	rusting	All metals corrode but only the corrosion of iron is called rusting.																																	
5b	Salt is present	Sea water contains ions of salt which speed up the rate of corrosion/rusting.																																	
5c	Zinc is more reactive than iron	Zinc provides sacrificial protection to iron because it is more reactive than iron. Zinc protects iron by giving it electrons.																																	
6a	quartz magnetite cassiterite	The lower the density the nearer the top of the liquid the substance will be.																																	
6b	tin oxide + carbon $\downarrow$ tin + carbon dioxide	tin oxide $+$ carbon	$\longrightarrow$	tin	$+$ carbon dioxide																														

6c	Tin does not corrode quickly	As tin is very slow to corrode it can be used to coat steel cans. The steel can does not corrode underneath as the tin layer prevents air and water getting to the steel underneath.																
7a	Any answer from:	<table border="1"> <tr> <td>kills wildlife harmful</td><td>bad for environment causes pollution</td><td>damages our health damages environment</td><td>kills fish kills birds</td></tr> </table>	kills wildlife harmful	bad for environment causes pollution	damages our health damages environment	kills fish kills birds												
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7b	Detergent dissolves in both oil & water	<p><u>HEAD</u> soluble in water</p> <p><u>TAIL</u> Soluble in oil/grease</p>																
8a	Any answer from:	<table border="1"> <tr> <td>Non-biodegradable Long time to break down Reduce land fills</td><td>Saves crude oil (Oil) is finite (Oil) will run out</td><td>Saves resources Finite resource Litter</td><td>Reused and causes less harm Damages wildlife</td></tr> </table>	Non-biodegradable Long time to break down Reduce land fills	Saves crude oil (Oil) is finite (Oil) will run out	Saves resources Finite resource Litter	Reused and causes less harm Damages wildlife												
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8b	ethene	<table border="1"> <tr> <td>Monomer</td><td>ethene</td><td>propene</td><td>chloroethene</td><td>styrene</td></tr> <tr> <td>Polymer</td><td>poly(ethene)</td><td>poly(propene)</td><td>poly(chloroethene)</td><td>poly(styrene)</td></tr> </table>	Monomer	ethene	propene	chloroethene	styrene	Polymer	poly(ethene)	poly(propene)	poly(chloroethene)	poly(styrene)						
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8c	Any answer from:	<table border="1"> <tr> <td>poisonous gases given off toxic gases given off</td><td>carbon monoxide given off carbon dioxide made</td><td>greenhouse gases global warming</td><td>carbon given off soot given off</td></tr> </table>	poisonous gases given off toxic gases given off	carbon monoxide given off carbon dioxide made	greenhouse gases global warming	carbon given off soot given off												
poisonous gases given off toxic gases given off	carbon monoxide given off carbon dioxide made	greenhouse gases global warming	carbon given off soot given off															
9a	synthetic or artificial or man-made	Synthetic fertilisers are made by the chemical industry to increase the amount of food that can be grown to feed the world population.																
9b	nitrogen, potassium or phosphorus	Fertilisers are soluble compounds containing one or more from: potassium, phosphorus and nitrogen																
9c	Pesticides	<table border="1"> <tr> <td>Chemical</td><td colspan="3">How It Protect Plants</td></tr> <tr> <td>Pesticide</td><td colspan="3">Protects plants from insects by killing insects</td></tr> <tr> <td>Herbicides</td><td colspan="3">Kills weeds which reduce the nutrients in the soil</td></tr> <tr> <td>Fungicides</td><td colspan="3">Protects plants from diseases which kill plants</td></tr> </table>	Chemical	How It Protect Plants			Pesticide	Protects plants from insects by killing insects			Herbicides	Kills weeds which reduce the nutrients in the soil			Fungicides	Protects plants from diseases which kill plants		
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9d	Strong Weak	Molecules are held together by bonds that are strong. Molecules only have weak bonds between them.																
10a	fermentation or anaerobic respiration	Glucose is turned into ethanol (alcohol) and carbon dioxide by enzymes in yeast in an environment with no oxygen.																
10b	To speed up reaction	Catalysts speed up reactions without being used up in the reaction.																
10c(i)	38°C	Enzymes have optimum temperature and pH condition where they work fastest.																
10c(ii)	Any Answer from:	<table border="1"> <tr> <td>enzyme stops working doesn't work as well</td><td>enzyme denatured</td><td>yeast stops working yeast denatured</td><td>yeast destroyed yeast is killed</td></tr> </table>	enzyme stops working doesn't work as well	enzyme denatured	yeast stops working yeast denatured	yeast destroyed yeast is killed												
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11a	Margarine A	Margarine A has lower percentage of unhealthy saturated fats																
11b	Greasy mark on filter paper	<table border="1"> <tr> <td>Chemical</td><td>Tested with</td><td>Positive Test</td></tr> <tr> <td>Starch</td><td>iodine solution</td><td>Turns blue/black</td></tr> <tr> <td>Glucose</td><td>warm Benedict's solution</td><td>Turns orange/brick red</td></tr> <tr> <td>Protein</td><td>soda lime + heat</td><td>Damp pH paper turns blue</td></tr> <tr> <td>Fat</td><td>filter paper</td><td>Greasy mark on paper</td></tr> </table>	Chemical	Tested with	Positive Test	Starch	iodine solution	Turns blue/black	Glucose	warm Benedict's solution	Turns orange/brick red	Protein	soda lime + heat	Damp pH paper turns blue	Fat	filter paper	Greasy mark on paper	
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12a	Blue to brick red	Other acceptable answers: <table border="1"> <tr> <td>Blue to orange</td><td>Blue to yellow</td><td>Blue to brown</td><td>Blue to red</td><td>Blue to green</td></tr> </table>	Blue to orange	Blue to yellow	Blue to brown	Blue to red	Blue to green											
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12b	caffeine	A drug alters the body from its natural state.
12c	10%	Percentage of daily calories = $\frac{\text{Calories in one can}}{\text{Recommended daily calorie intake}} \times 100 = \frac{200}{2000} \times 100 = 10\%$
13a	same volume of water in each test tube	The experiment is only a fair test if all the variable are kept the same except the variable that is be investigated
13b	temperature difference or starting and final temperature	The greater the change in temperature, the greater the energy given out.